A note on subject-internal parasitic gaps

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A Note on Subject-Internal Parasitic Gaps*

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0. Introduction

Though they are constructions which native speakers do not frequently encounter, parasitic gap (PG) constructions are generally accepted. Thus, Universal Grammar needs to specify some mechanism for interpreting these constructions, such as chain composition (cf. Chomsky (1986), Browning (1987) and Frampton (1990)) or coordination (cf. Haïk (1985) and Williams (1991)). In this sense, it is important to study PGs.

The present paper mainly concerns subject-internal PGs such as (1) below:

(1) a. John is the man whom [everyone who knows e] admires t.
b. Who did pictures of e annoy t?

Above, and below, e and t refer to the PG and the real trace, respectively. PGs are bound by empty operators which undergo Wh-movement. (1) shows that PGs can occur within subject relative clauses or simple subjects. Interestingly, PGs in relative clauses like (1a) and those in simple subjects like (1b) are different in some respects, as observed in Johnson (1985), though both types of PGs occur in subject NPs. I would like to suggest in this paper that the referent of an empty operator binding a PG in a subject relative clause and that of an empty operator binding a PG in a simple subject are fixed differently, based on a difference in contexts where they occur.

This note is organized as follows. In section 1, I will introduce Stowell's (1990) suggestion on the determination of the referent of an empty operator binding a PG in a simple subject. In section 2, I will claim that Stowell's suggestion is not applicable to

empty operators binding PGs within a subject relative clause and that the relationship between empty operators and their antecedents is different in terms of coreferential relation in the two cases.

1. PGs in simple subjects and Weak Crossover (WCO) effects

1.1. WCO effects

Stowell (1990) notes that PG constructions like (1b) are apparent counterexamples to his account of WCO effects. He is concerned with the determination of the referent of the empty operator. Before discussing PG constructions, let us summarize Stowell's account of WCO effects.

In the literature, (2a) and (2b), with LFs like (2c), are excluded due to a WCO violation:

(2) a. *Who$_i$ did his$_i$ mother visit t$_i$?
b. *His$_i$ mother visited everyone$_i$.
c. OP$_i$ ... [[... Pronoun$_i$ ...][... t$_i$ ...]]
(Stowell (1990))

Pronouns cannot be interpreted as bound variables, unless they are c-commanded by traces left by operators like who and everyone.

Stowell (1990) provides an account of WCO effects based on the slash-indexing convention proposed by Haïk (1984). The slash-indexing convention as provided by Stowell is given below:

(3) If an operator O c-commands XP, where XP has the intrinsic index i, and XP contains an element bound by O, then the index of O is assigned to XP as a slash-index appended to the intrinsic index of XP. (Stowell (1990))

(3) applies to (2a) to yield the following LF representation:

(4) Who$_i$ [his$_i$ mother]$_{k/i}$ visits t$_i$

(3) applies to (5a), which is not a WCO violation, to yield the LF representation in (5b):

(5) a. Who$_i$ visits his$_i$ mother?
b. Who$_i$ t$_i$ visits [his$_i$ mother].

In (4), which is a LF representation of a WCO violation, the wh-trace is locally A-bound by the slash-index on the subject. In (5b), on the other hand, the wh-trace is locally A-bar-bound. Stowell considers that WCO results when wh-traces are A-bound by slash-indices on NPs, yielding a violation of Condition C of the Binding Theory.

1.2. PRO gates and PGs in simple subjects

Stowell discusses problems for his analysis raised by PRO-gate examples and PGs in simple subjects. Consider the following examples given in Stowell (1990):

(6) a. Who$_i$ did [PRO$_i$ washing his$_i$ car]$_{\not A/}$ annoy t$_i$?
b. ?Who$_i$ did [Mary's pictures of e$_i$]$_{\not A/}$ annoy t$_i$?

(6a) is a PRO-gate example, whereas (6b) contains a PG. Stowell's theory predicts that both sentences should be instances of WCO violations. The subject NPs should bear the index of who as slash-indices, as indicated in (6), which A-bind the wh-traces. Thus both (6a) and (6b) should be excluded in the same way as (2a) and (2b), which is not, however, the case.

Stowell ascribes the grammaticality in (6a) to the control relation. It has been observed in the literature that PRO occurring in gerunds functioning as subjects is generally controlled by the object NP in the next clause up. This is indicated in the following examples:

(7) a. *[PRO$_i$ shaving himself$_i$] convinced Mary to trust John$_i$.

b. [PRO$_i$ shaving himself$_i$] convinced John$_i$ to grow a beard.
(Safir (1984))

Next consider a PRO-gate example:

(8) *Who$_i$ did [PRO$_i$ washing his$_i$ car] induce Mary to visit t$_i$?
(Stowell (1990))

The contrast between (6a) and (8) suggests that the control relation is involved in PRO-gate examples as well. Stowell thus claims that (6a) has the following structure, before PRO is controlled by the trace:

(9) Who$_i$ did [PRO$_k$ washing his$_k$ car]$_j$ annoy t$_i$

He assumes that slash-indexing applies before PRO is controlled by the wh-trace. When slash-indexing applies, the trace and PRO have distinct indices. In (9), there is no A-binder of the wh-trace.

Stowell further assumes that the empty operator binding the PG is also controlled by the real trace. Slash-indexing applies before the empty operator is controlled by the real trace. Therefore, (6b) does not yield a WCO violation.

Suppose that Stowell is essentially correct. His assumption implies that the referent of the empty operator binding the PG in the simple subject is fixed by control. He is not concerned with PGs in subject relative clauses, however. It is thus interesting to pose the question of whether empty operators binding PGs in subject relative clauses are also subject to control. In the next section, I attempt to answer this question.

2. PGs in subject relative clauses

2.1. On the control relation

Stowell's theory, introduced in the preceding section, should

exclude (1a) as a WCO violation, since the subject relative clause in (1a) will bear the index of whom as a slash-index, as shown in (10) below:

(10) John is the man whom$_i$ [everyone who knows e]$_i$ admires t$_i$.

The slash-index on the subject NP locally A-binds the real trace. (1a) is, however, acceptable. We need to question whether the same explanation for the grammaticality of (6) can be appealed to in the case of (1a). Namely, is the empty operator in (1a) controlled by the real trace?

There is evidence to believe that the control relation is not involved in (1a). Takano (1991) observes that PRO contained within a matrix subject can be controlled by the subject NP in a complement clause of a matrix verb, but not by the object NP in a complement clause of a matrix verb:

(11) a. [*PRO$_i$/his$_i$ relieving himself$_i$ from the night watch] shows that the commander should have fired John$_i$.
(Lebeaux (1984))

b. [PRO$_i$ relieving himself$_i$ from the night watch] shows that John$_i$ should have been fired by the commander.
(Takano (1991))

Let us note the fact that resumptive pronouns can license PGs in subject relative clauses:

(12)??The guy$_i$ that everyone who meets e usually ends up wondering whether or not he$_i$'ll ever leave MIT.
(Johnson (1985))

Now, consider the following examples:

(13) a. John$_i$, whom everyone who knows e$_i$ wonders whether Mary loves him$_i$, is handsome.

b. John$_i$, whom everyone who knows e$_i$ wonders whether he$_i$ is loved by Mary, is handsome.

(13) indicates that the occurrence of PGs in relative clauses is permitted, regardless of whether the resumptive pronouns coindexed with PGs function as subjects or objects in complement clauses of matrix verbs. If empty operators binding PGs in subject relative clauses were subject to control, (13a) should be unacceptable. The resumptive pronoun is an object NP in the complement clause of the matrix verb. Thus we can conclude that empty operators involved in PG constructions like (1a) are not subject to control and hence that their referents are not fixed by control.

If the conclusion reached above is correct, we must again ask why WCO effects are absent in (1a). How is the referent of the empty operator determined? I will be concerned with these issues in the next subsection.

2.2. WCO effects and PGs in subject relative clauses

2.2.1. On the absence of WCO effects

As we have seen, WCO effects are absent in (1a). There are cases, however, where a WCO violation seems to arise in constructions involving PGs in subject relative clauses.

Johnson (1985) notes that question wh-phrases can be antecedents of real traces licensing PGs appearing in adjunct clauses and simple subjects, as in (14):

(14) a. Who did you see t before meeting e

b. Who do pictures of e amuse t (Johnson (1985))

This is not the case, however, for PGs in subject relative clauses:

(15) a. *Who does everyone who meets e usually admire t?

b. *I wonder who everyone who meets e usually admires t?

(Johnson (1985))

As shown in (15), PGs cannot occur if question wh-phrases are antecedents of the real traces. Johnson does not give any account of this phenomenon. I will suggest that the sentences in (15) are excluded due to a WCO violation. (1a) may then be considered a construction where WCO effects are suspended.

Stowell and Lasnik (1987) observe that there are several constructions in which WCO effects are suspended, though their LF representations would be as in (16):

(16) OP_i ... [[... XP_i ...]$_{k\neq i}$ $t_{k\neq i}$ [... t ...]]

Consider the following examples:

(17) a. $John_i$, I believe his_i mother loves t_i

b. It was $John_i$ that his_i mother was talking about t_i

c. $John\ Smith_i$, who his_i wife loves t_i, will arrive early

(Stowell and Lasnik 1987)

The sentences in (17) show that WCO effects are not found in topicalization constructions, cleft constructions, or non-restrictive relative clauses.[1] Stowell and Lasnik differentiate between the operators binding the traces in (17) and those in (2) semantically. They call these a nonquantificational and quantificational opearators, respectively.[2] WCO effects are absent when wh-traces are left by nonquantificational operators. In constructions where WCO effects are suspended, PGs in subject relative clauses are allowed:[3]

(18) a.??Tom, everyone who knows e admires t.

b. It is Tom that everyone who knows e admires t.

c. Tom, whom everyone who knows e admires t, never breaks a promise.

Though WCO effects are found in wh-question constructions, as shown in (2a), Stowell and Lasnik observe that WCO effects are suspended even in wh-question constructions, if adjunct-internal PGs are involved, as illustrated in (19):

(19) a. Who$_i$ did you gossip about t$_i$ despite his$_i$ teacher's having vouched for e$_i$?

b. Which man$_i$ did you meet with t$_i$ before his$_i$ mother had spoken to e$_i$?

(Stowell and Lasnik (1987))

The empty operators binding the PGs in (19) are counted as nonquantificational operators. Interestingly, the occurrence of PGs in subject relative clauses seems to be possible if a wh-phrase functioning as a question operator binds the real trace licensing an adjunct-internal PG:

(20)??Who$_i$ does Tom want to meet t$_i$ because everyone who knows e$_i$ admires e$_i$

(20) is less unacceptable than (15a-b). Though (20) is a wh-question construction, as are (15a-b), the PG in the relative clause is permitted. PGs in subject relative clauses thus seem to be allowed only in constructions where WCO effects are not observed.

There arises a problem, however. WCO effects are found in restrictive relatives, as observed in Safir (1986), and Stowell and Lasnik (1987):[4]

(21) a.?*Who did his$_i$ mother see t$_i$

b.?*A man$_i$ who his$_i$ wife loves t$_i$ arrives early.

(Safir (1986))

It thus seems difficult to consider that (1a) is acceptable because it is a construction where a WCO effect is suspended.

I want to claim here that the relative clause in (1a) is not a restrictive relative clause, but a pseudo-relative clause. Pseudo-relative clauses are discussed by McCawley (1981). McCawley argues that certain restrictive relative clauses are actually of a different type. He calls these pseudo-relative clauses. Consider the following examples:

(22) a. There are many Americans who like opera.

b. Norman has interviewed many Americans who like opera.

(McCawley (1981))

McCawley shows that the relative clauses in (22a) and (22b) are different in syntactic and semantic nature from each other, though they are string-identical. He conjectures that the former and the latter are a pseudo-relative and a restrictive relative clause, respectively.

McCawley provides supporting arguments for his claim that pseudo-relative clauses should be distinguished from restrictive relative clauses. First, the insertion of a parenthetical before pseudo-relative clauses yields a fully grammatical sentence, while the insertion of a parenthetical before restrictive relative clauses does not:[5]

(23) a. There are many Americans, as you know, who like opera.

b.??Norman has interviewed many Americans, as you know, who like opera.

Second, there is a semantic difference in the interpretation of

many in (22a) and (22b). Though many denotes a large number of a certain set in both examples, the sets over which many operates are different in (22a) and (22b). In (22a), the set is provided by the set of all Americans, whereas in (22b), it is that of Americans who like opera. (22a) thus asserts that many Americans like opera, whereas (22b) does not.[6]

Though McCawley does not discuss differences in WCO effects between them, it seems that restrictive relatives and pseudo-relatives also differ in this regard. Consider the following examples:

(24) a.??There are many women$_i$ who their$_i$ husbands love t$_i$.
b. *Tom interviewed many women$_i$ who their$_i$ husbands love t$_i$.

Semantically, it is possible to say that (24a) and (24b) contain a pseudo-relative and a restrictive relative, respectively. The contrast in grammticality observed above indicates that WCO effects found in restrictive relatives are rather stronger than those found in pseudo-relatives.[7]

Keeping the facts concerning the differences between pseudo-relatives and restrictive relatives in mind, consider (25a), where the relative head many Americans occurs in a there-construction, and (25b), where it occurs as the object of the verb interview:

(25) a. There are many Americans who everyone who knows e admires t.
b. *Tom interviewed many Americans who everyone who knows e admires t.

Semantically, the relative clauses in (25a) and (25b) are pseudo-relatives and restrictive relatives, respectively. Though the wh-phrase does not function as a question operator in (25b), the sentence is unacceptable. It is not unnatural to consider that the contrast between (25a) and (25b) has something to do with the contrast

between (24a) and (24b). WCO effects are suspended in pseudo-relative clause constructions and PGs in subject relative clauses can occur in constructions involving pseudo-relative clauses. WCO effects are observed in (24b). (25b) as well as (15a-b) may then be an instance of a WCO violation.[8]

Reconsider (1a), which is a typical example of a sentence containing a PG in a subject relative clause:

(1) a. John is the man whom everyone who knows e admires t.

The man whom everyone who knows admires in (1a) can be taken to be a pseudo-relative clause, for the parethetical can intervene between the relative head and the clause as in (26):

(26) John is the man, as you know, whom everyone who knows e admires t.

From the observations made above, it can be concluded that (1a) contains a pseudo-relative clause and that WCO effects are suspended.[9]

Summarizing, PGs are not permitted in subject relative clauses in those constructions where WCO effects are not suspended.[10] (1a) contains a pseudo-relative clause, where WCO effects are absent. Thus it is acceptable.

2.2.2. On the determination of the referent of the empty operator

We have claimed that the control relation is not involved in the determination of the referent of the empty operator binding a PG in a relative clause and that this type of PG cannot occur in the constructions where WCO effects are not suspended. Recall that Stowell relates the absence of WCO effects in the constructions like (1b) to the determination of the referent of the empty operator. It is thus likely that the absence of WCO effects in (1a), (18), (20) and (25a) is related to the determination of the referents of the empty

operators.

As noted in 2.2.1, Stowell and Lasnik (1987) suggest that the operator in cases where WCO effects are suspended and the operator in cases where a WCO violation arises are semantically different. The former is a nonquantificational operator and the latter is a quantificational operator. For example, a wh-operator in an interrogative sentence in which a WCO violation arises functions as a quantifier ranging over a nonsingleton set. A wh-operator in an appositive relative, in which WCOs are absent, on the other hand, functions as a nonquantificational operator and does not range over any nonsingleton set. The wh-operator is coindexed with a relative head which has intrinsic reference with a coreferential interpretation.

Further consider (22), for instance, repeated here:

(22) a. There are many Americans who like opera.
Norman has interviewed many Americans who like opera.

In the case of (22a), where a pseudo-relative clause construction is involved, the relative clause does not play a role in determining the set. Rather, the relative clause functions as a predicate of many Americans. The relative operator refers to many Americans, that is, the set defined by many Americans. The set can be considered to be referential. In this sense, it can be said that the relative head in (22a) has intrinsic reference. On the other hand, the relative operator in (22b) does not refer to many Americans. The relative clause in (22b) defines the set of Americans who like opera. The relative operator heading the restrictive relative clause is not coindexed with an element having intrinsic reference.

It can thus be said that the pronouns in (17), (19) and (24a) are thus coindexed with the nonquantificational operators, whose antecedents have intrinsic reference. Though Stowell and Lasnik object to an approach based on accidental coreference, their

suggestion would mean that the pronouns in (17) and (19) do not function as bound variables and that these pronouns may be coreferential with the operators. I would like to suggest that in (1a) where the PG in a subject relative clause occurs, the empty operator is coreferential with nonquantificational whom. Whom is coindexed with the man, which has intrinsic reference. The referent of the empty operator is fixed not through binding or control, but through accidental coreference. In (15), on the other hand, the wh-phrases are quantificational operators and the referents of the empty operators cannot be fixed through coreference.

Assume that in (1a), the index of the empty operator and that of whom are originally distinct. This would be the reason that the empty operator is not interpreted as an bound variable. Assume further that slash-indexing applies before the empty operator and whom are coindexed. (1a) would thus have the following structure:

(27) John is the man$_i$ whom$_j$ [everyone who OP$_j$ knows e$_i$] admires t$_i$.

(27) does not violate the Binding Conditions. In (15a), since they cannot be in coreference relation, the wh-phrase and the empty operator must share the same index originally to be coindexed, which yields a WCO violation. Furthermore, unlike the case of (27), reindexation is impossible. The same holds of (15b).

Though further investigation is necessary, from the observations made so far, it can be concluded that it is not unnatural to consider that accidental coreference is involved in the determination of the referent of the empty operator of a PG in a subject relative clause.[11]

3. Conclusion

I have argued that the PGs in (1a) and (1b) are different in nature, though both of them occur within the subject NPs. PGs in subject relative clauses cannot occur in constructions where WCO

effects are found. This is not the case for PGs in simple subjects. The difference between two types of subject-internal PGs in this respect is perhaps related to the determination of the referents of the empty operators involved. The referents of the empty operators in (1a) and (1b) are determined by way of accidental coreference and control, respectively. The issue dealt with in this note thus relates to the determination of the referent of empty categories.

Notes

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[1] Stowell and Lasnik observe that WCO effects are absent in Tough-Constructions as well.

(i) John$_i$ is easy for his$_i$ wife to love t_i.

(Stowell and Lasnik (1987))

[2] It is not altogether clear whether empty operator movement is involved in topicalization constructions.

[3] It is not clear why (18a) is less acceptable than (18b) and (18c). I will not be concerned with this problem here.

[4] For some speakers, WCO effects are not found even in restrictive relative clauses. Chomsky (1982) observes that WCO effects are absent in relative clauses generally.

[5] McCawley does not give the examples in (23). I owe the judgements to R. Martin.

[6] See McCawley (1981) for further differences between restrictive relatives and pseudo-relatives.

[7] It is unclear why (24a) is not good as it should be, or why the contrast between (24a) and (24b) is as minimal as it is. I will

not be concerned with this question here.

[8] Recall (21b), which exhibits WCO effects.

(21) b.?*A man$_i$ who his$_i$ wife loves t$_i$ arrives early.

Note that PGs in subject relative clauses are not allowed in (i):

(i)?*A man$_i$ who everyone who knows e$_i$ admires t$_i$ arrives early.

[9] The question now arises why (i) is unacceptable:

(i) *John is the man whom$_i$ [everyone who knows him$_i$] admires t$_i$.

As shown in (26), the man whom everyone who knows him admires counts as a pseudo-relative clause. Nevertheless, (i) is unacceptable. I would like to claim here that (i) does not raise a serious problem at all to the conclusion drawn so far for the following two reasons.

First, it would not be unnatural to assume that the empty category (PG) and the overt category (him) behave rather differently. The contrast in grammaticality between (1a) and (i) can be ascribed to the differences between them. Consider the following Italian examples from Cinque (1990):

(ii) a.??Un uomo$_i$ che quelli che dicevano che pro$_i$ era
a man who those who used to say that was
disonesto in realtà non conoscevano t$_i$
dishonest in fact did not know
b. *Un uomo$_i$ che quelli che dicevano che lui$_i$ era disonesto
in realtà non conoscevano t$_i$ (Cinque (1990))

(iia) and (iib) differ in only one point. An empty pronominal appears in subject position in the former, while an overt pronominal appears in subject position in the latter. The contrast between (iia) and

(iib) in acceptability can be traced to the difference between empty and overt categories.

Second, even in the contexts where WCO effects are absent, observed by Stowell and Lasnik (1987), there is a difference in acceptability between instances with possessive pronouns and those with pronouns appearing in relatives, as shown in (iii):

(iii) a. John$_i$, who his$_i$ wife loves t$_i$ very much
b.??John$_i$, who a woman who loves him$_i$ kisses t$_i$ everyday

Stowell and Lasnik's prediction would be that both examples are cases where WCO effects are absent. Nevertheless, (iiib), in which the pronoun appears in a relative clause, are slightly less acceptable than (iiia), in which the pronoun appears as a genetive NP. This contrast must not be related to WCO effects. The unacceptability of (i) may not be due to a WCO effect itself.

[10] Actually, there are speakers who accept PG constructions like (1a). Williams (1991) is one of them. Hoji (to appear) notes that this may be related to D-linking, discussed by Pesetsky (1987). D-linked wh-phrases are related to referential sets preestablished in discource. Pesetsky argues that the addition of the hell to question wh-phrases forces the non-D-linked wh-phrase reading. According to Hoji, speakers who accept PG constructions like (1a) do not seem to accept the following example:

(i)?*What the hell did most people who saw/ate e (at the party) like t? (Hoji (to appear))

[11] Hoji (to appear) also suggests that a coreference interpretation is involved in PG constructions like (1a).

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